



RED HAT DEVELOPERS

Reactive Programming, Systems and
Microservices

@burrsutter

<http://bit.ly/reactiveworkshop>

https://github.com/burrsutter/reactive_tutorial_jfokus17

@burrsutter

Change History

0.1 - JFokus 2017

Jfokus

<http://developers.redhat.com>

N

NERD



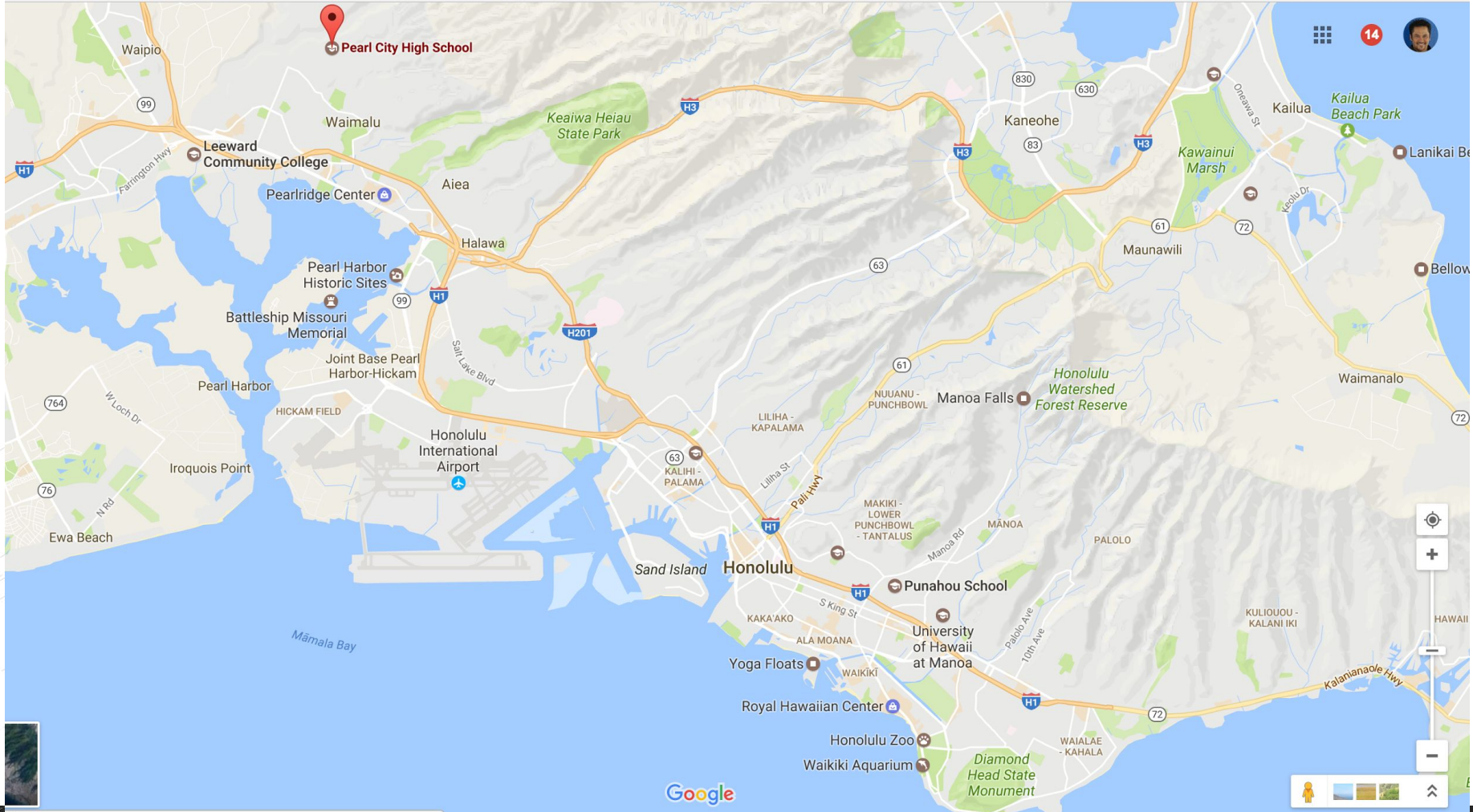
Viewers cautioned. Contains scenes of intense coding action, IDE usage, and suggestive syntax.

Hej världen (Hello World)

State of the Art







@burrsutter















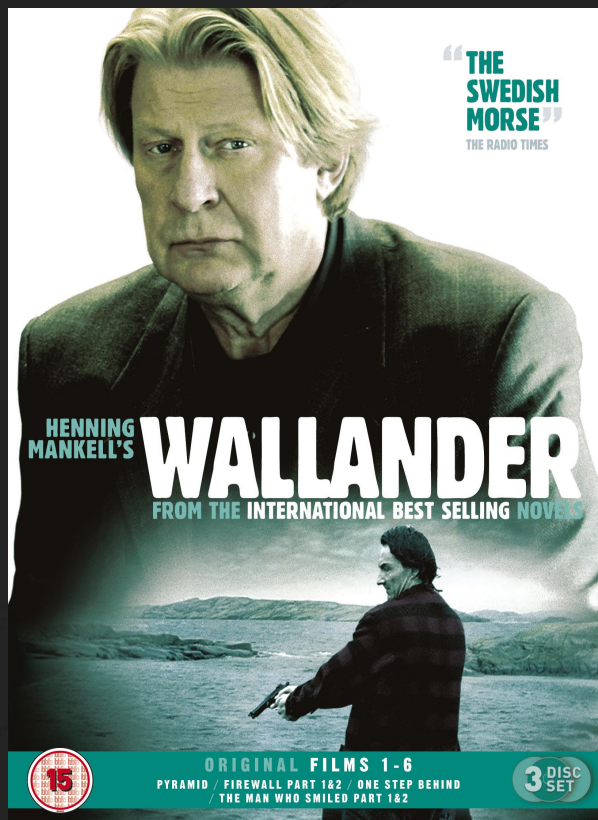


Jfokus

ABBA[®]









Jfokus

CUSTOMERS PARTNERS DEVELOPERS OPEN SOURCE



Technologies

Services & support

Success stories

About Red Hat

VIDEO

IKEA vs. Shellshock: 1-0

EDVÅRD



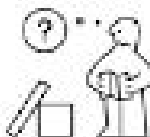
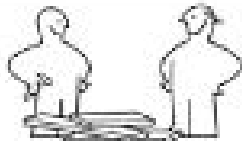
ÄLIEN



- 1
- 2
- 3
- 4



RESEARCH



**BÖRK
BÖRK
BÖRK**



Design and Quality Issues and Solutions



Both have clear main components:
 • the Party's political platform

Little do EC board, Bank bank bank
Banks-a-could Shrodder.

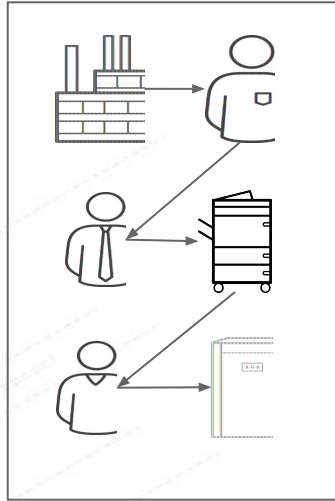
Learn how Swedish Chiff and
Club dem apples.

Warm, moist, close, humid, humid



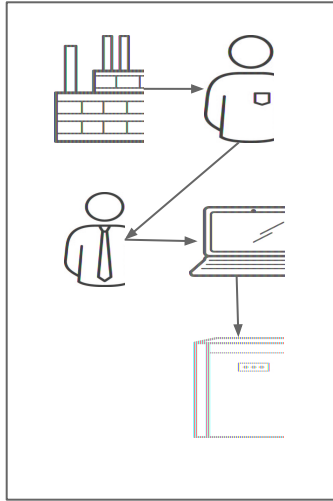
Business & IT: 80s to Future

ChUI



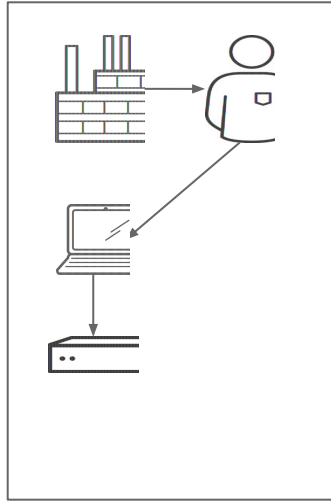
80's

GUI



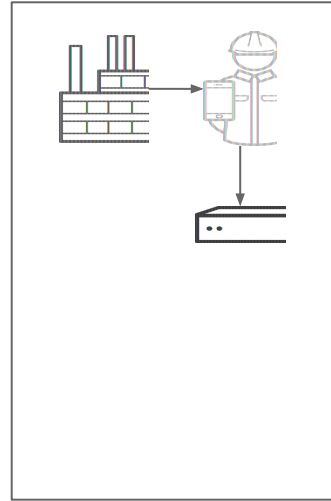
90's

Web



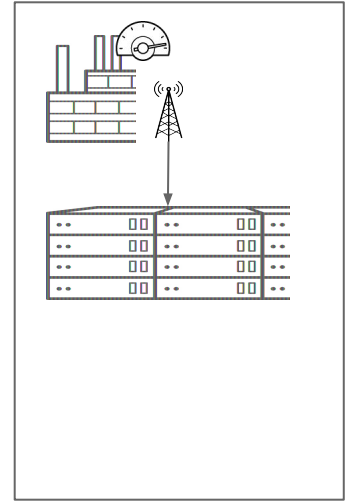
00's

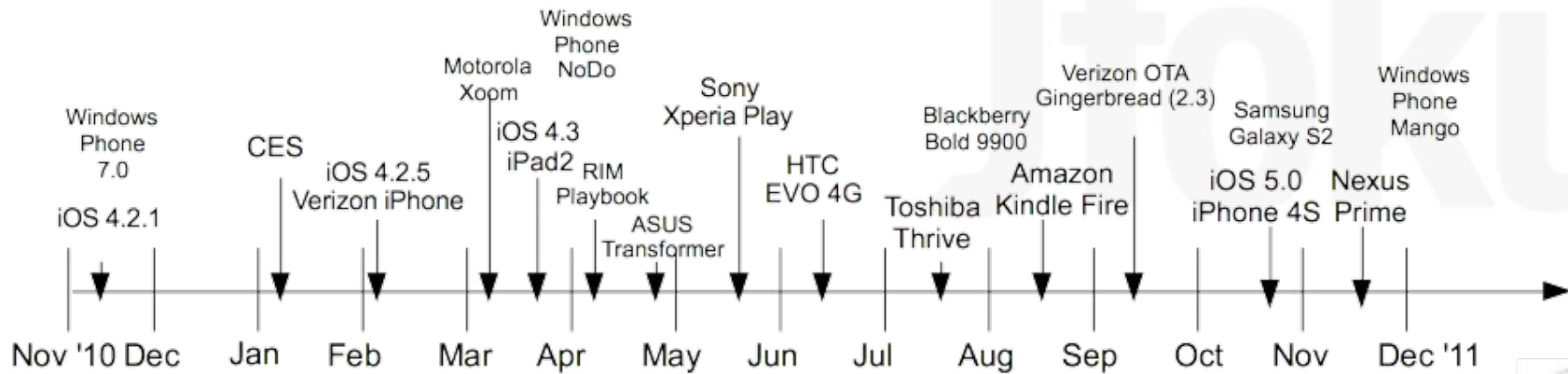
Mobile

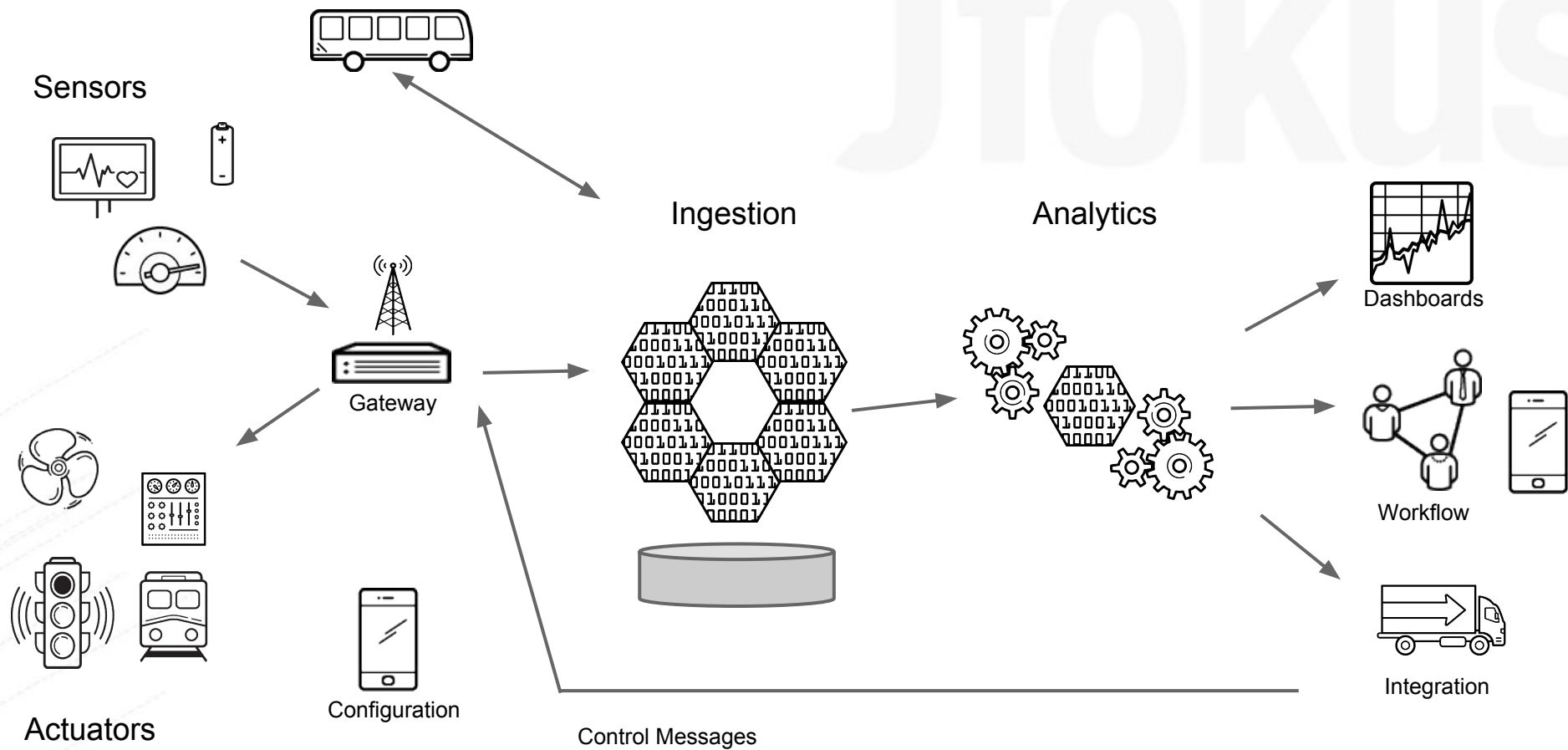


10's

Things







Reactive



reactive

adjective | re·ac·tive | \rē-'ak-tiv\

Popularity: Bottom 50% of words

Examples: REACTIVE in a sentence ▼

Definition of REACTIVE

- 1 : of, relating to, or marked by **reaction** or **reactance**
- 2 **a** : readily responsive to a stimulus
- b** : occurring as a result of stress or emotional upset <*reactive* depression>



stimulus

noun | stim·u·lus | \ˈstim-yə-ləs\

Popularity: Top 30% of words

Examples: STIMULUS in a sentence ▼

Definition of STIMULUS

plural **stimuli** \-,lī-, -lē\

: something that **rouses** or **incites** to activity: such as

a : INCENTIVE

b : STIMULANT 1

c : an agent (as an environmental change) that directly influences the activity of a living organism or one of its parts (as by exciting a sensory organ or evoking muscular contraction or glandular secretion)



Erik Meijer

Microsoft 2000-2013

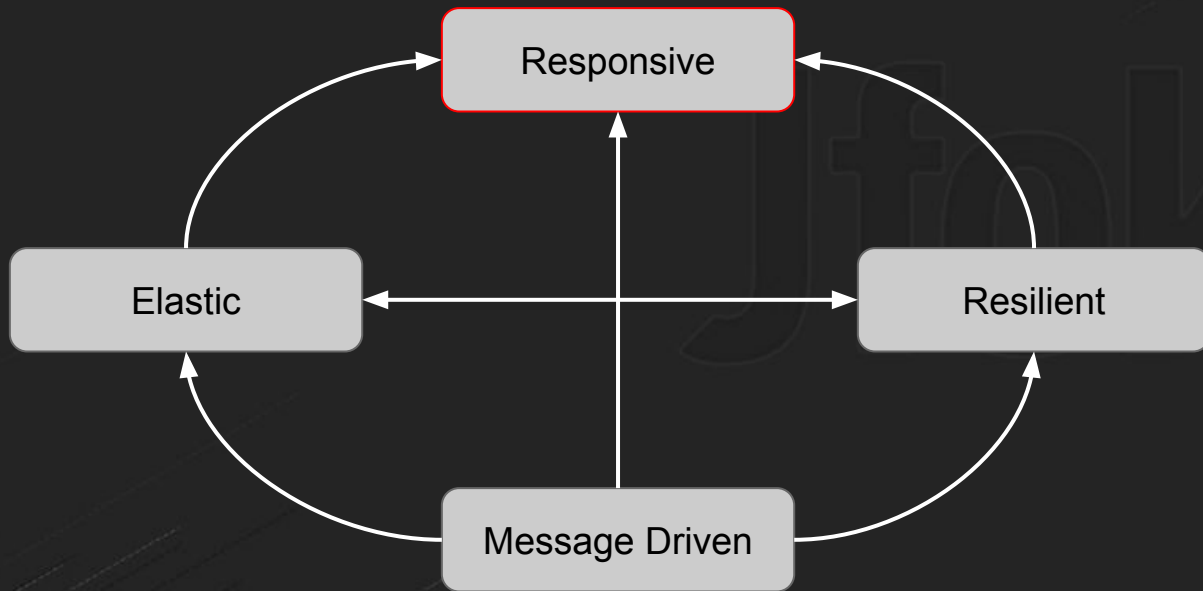
Reactive Extensions

[https://en.wikipedia.org/wiki/Erik_Meijer_\(computer_scientist\)](https://en.wikipedia.org/wiki/Erik_Meijer_(computer_scientist))

“Reactive programs also maintain a continuous interaction with their environment, but at a speed which is determined by the environment, not the program itself.” Wikipedia - Reactive Programming

Reactive Manifesto

Reactive Systems



**Reactive programming is programming with
asynchronous data streams.**

<https://gist.github.com/staltz/868e7e9bc2a7b8c1f754>



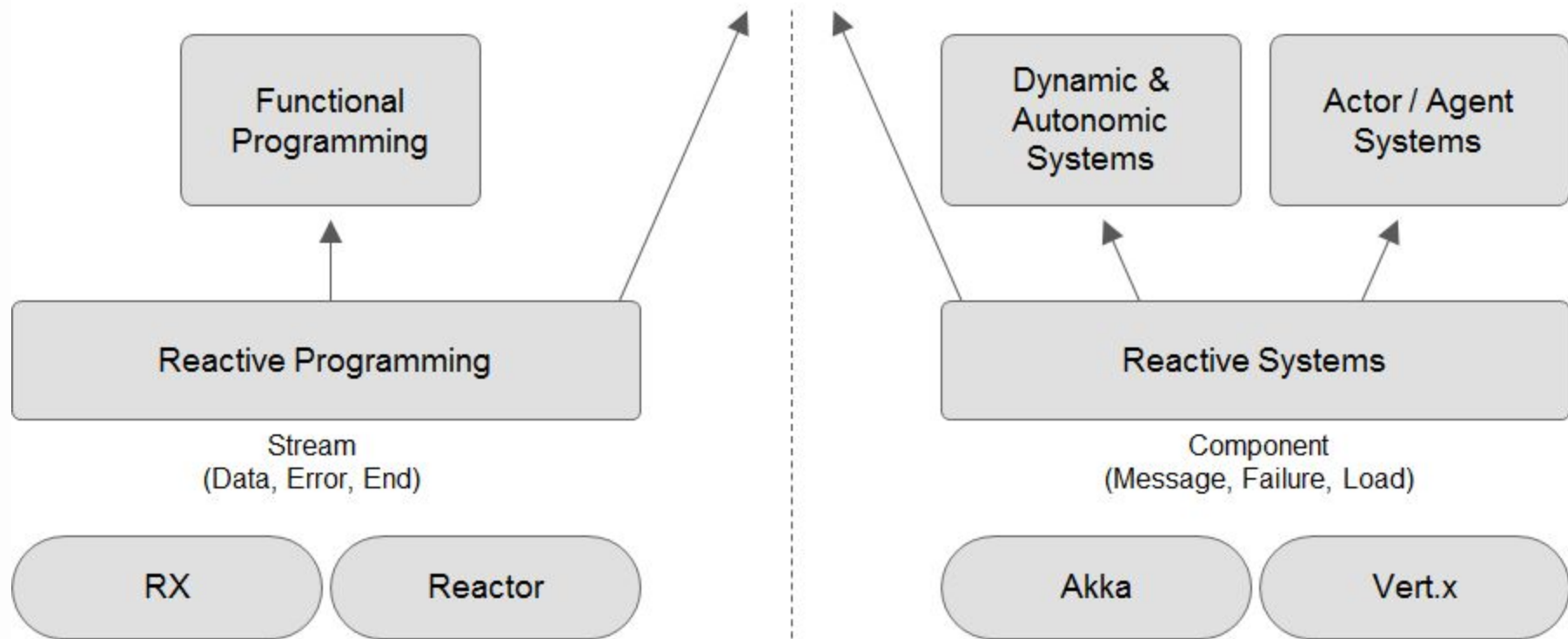


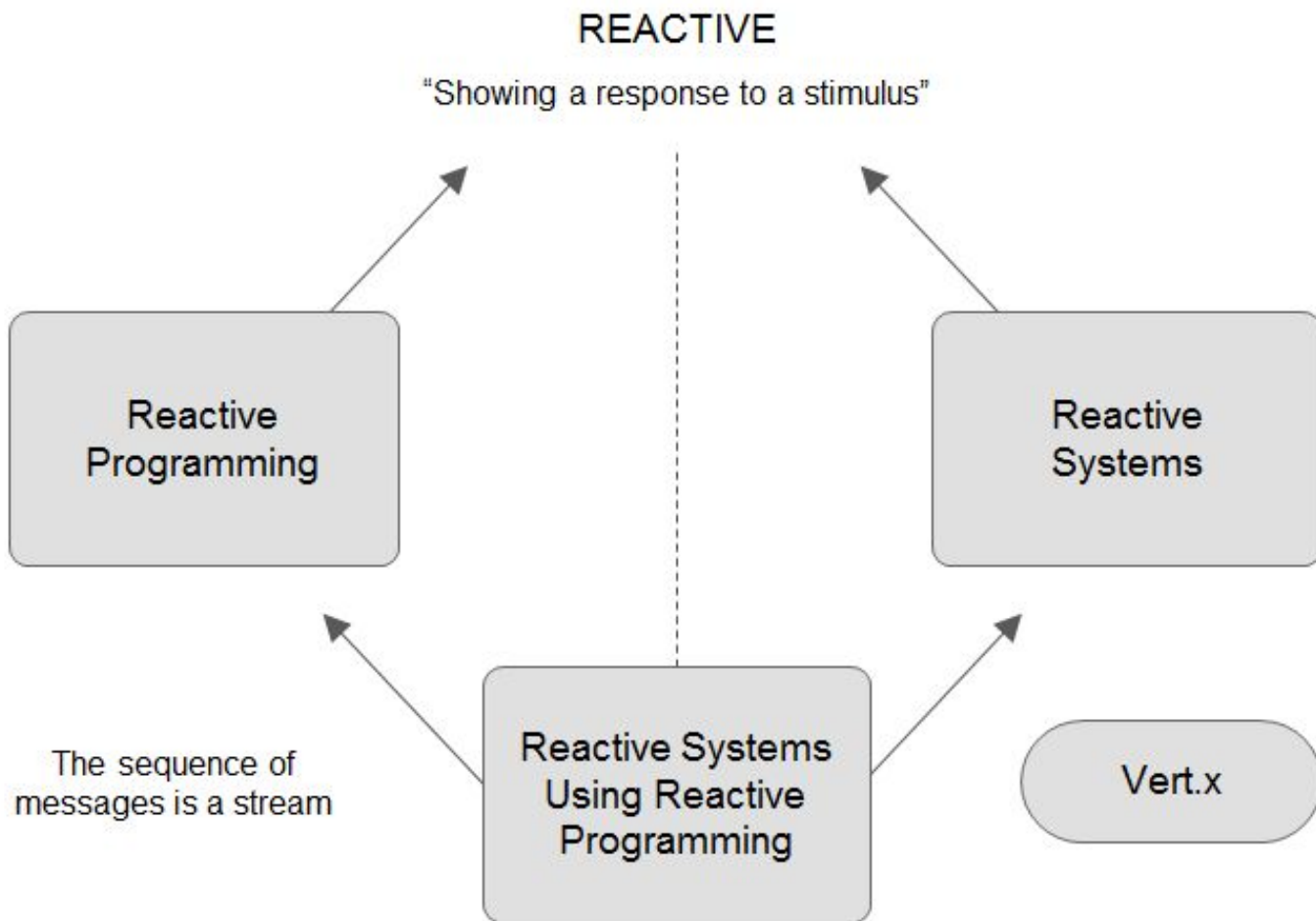
RxJava – Reactive Extensions for the JVM – a library for composing asynchronous and event-based programs using observable sequences for the Java VM.

<http://reactivex.io/>
<https://github.com/ReactiveX/RxJava>

REACTIVE

"Showing a response to a stimulus"

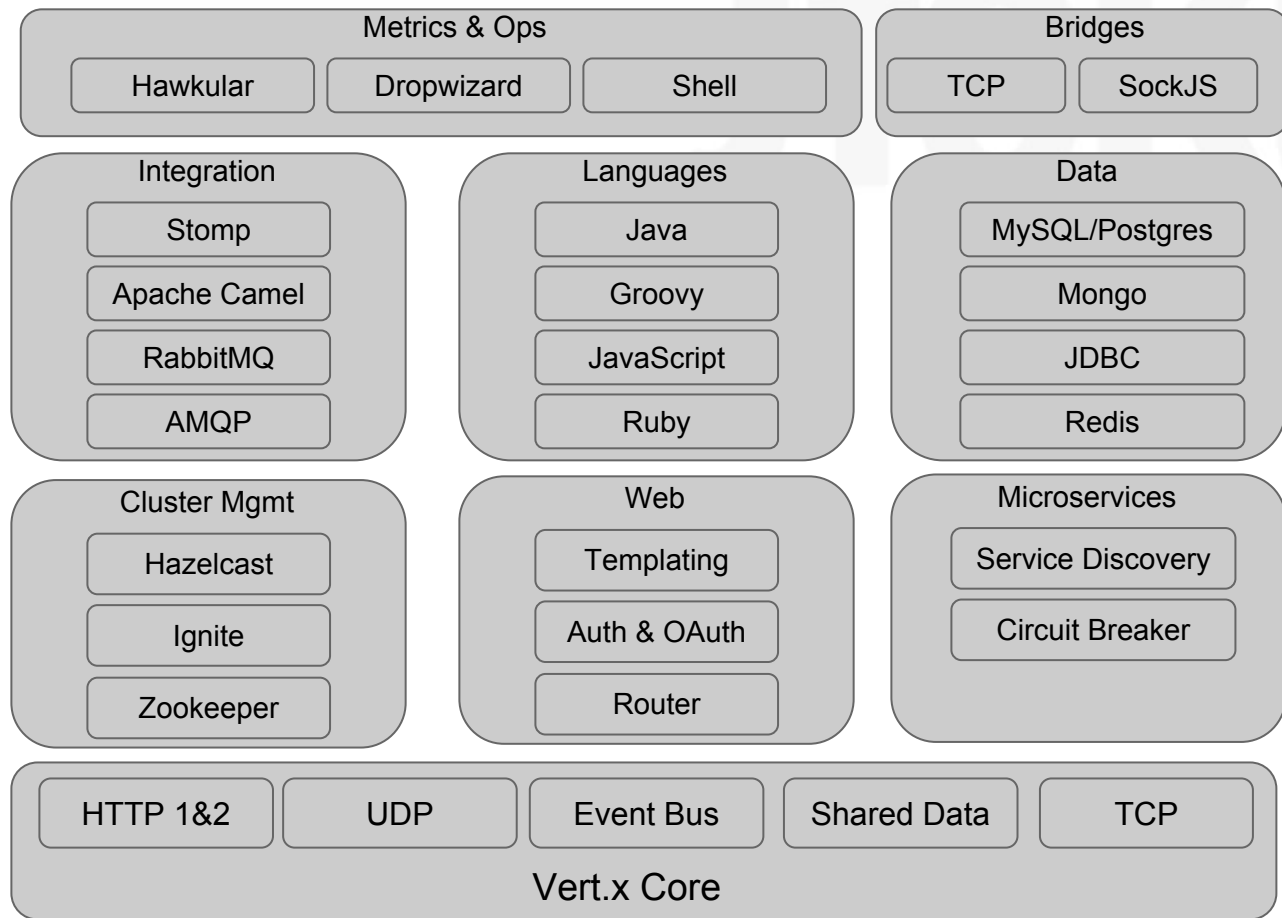




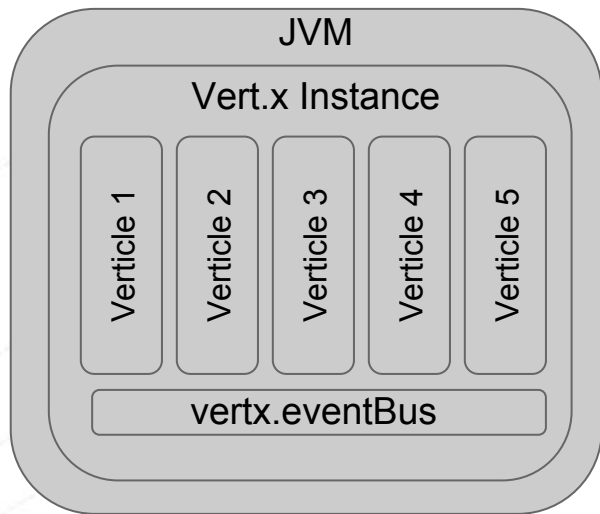


Vertx.io—an Eclipse project

Vert.x is a toolkit
for building reactive
applications on the JVM.



Vert.x Verticle

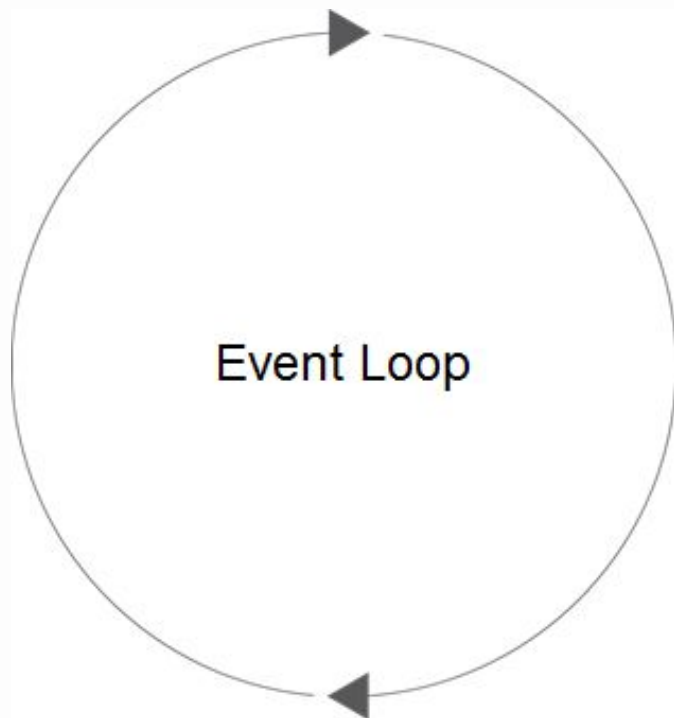


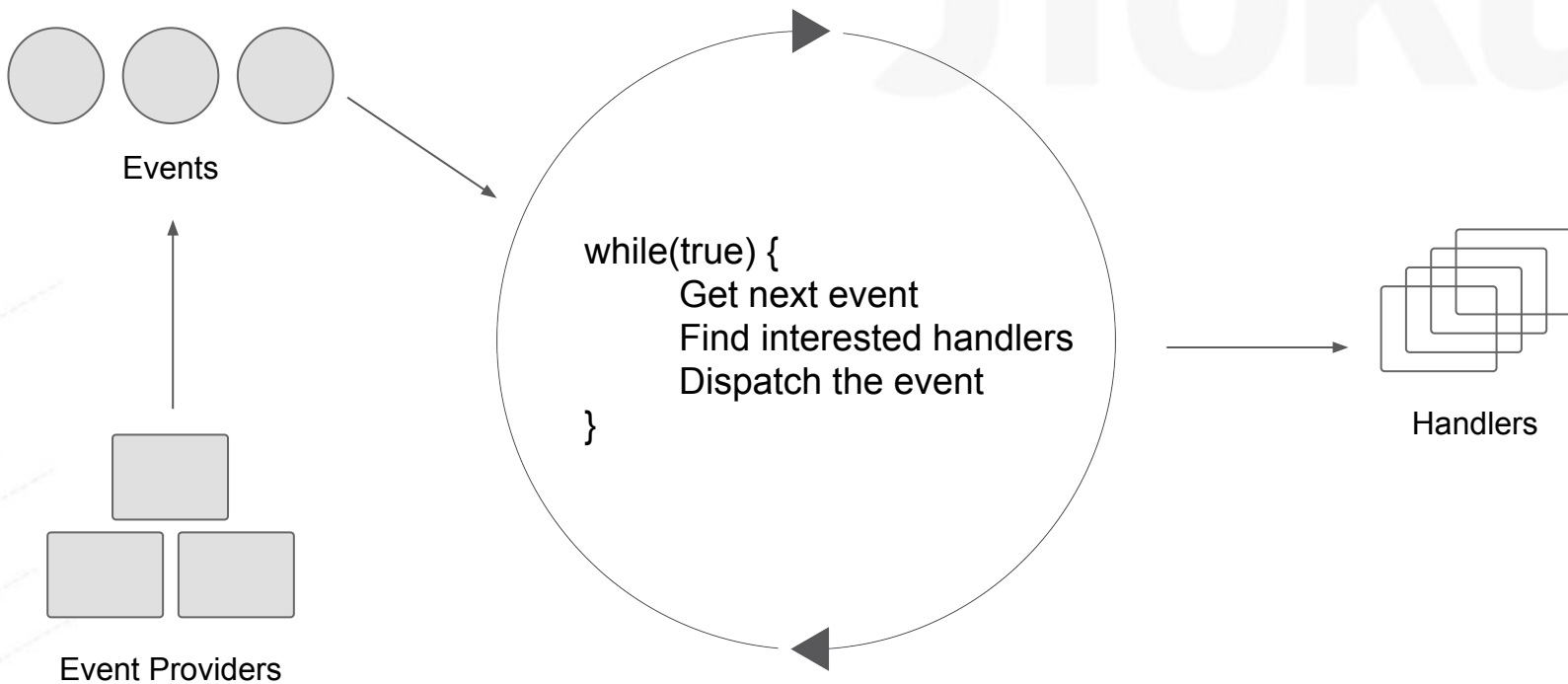
A Verticle is the programmable unit – a component

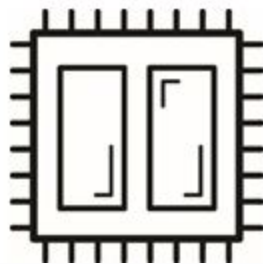
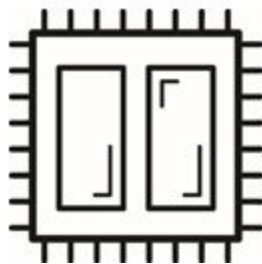
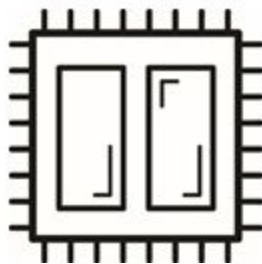
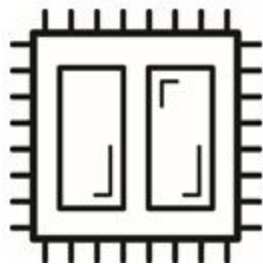
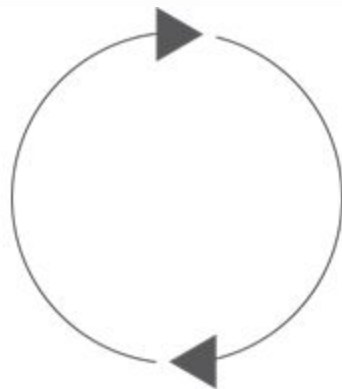
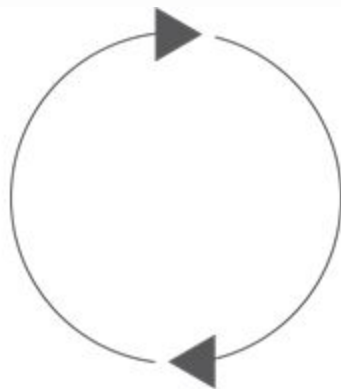
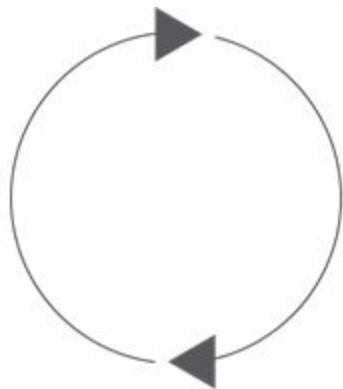
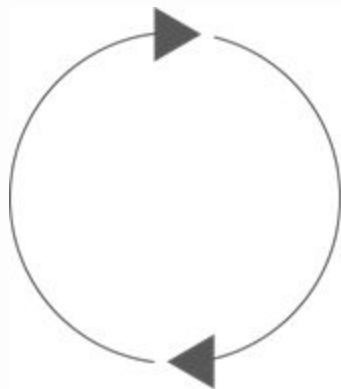
A Verticle is always executed on the same thread

A single thread may execute several verticles – event loop

A Verticle Instance normally starts 1 thread/event-loop per core

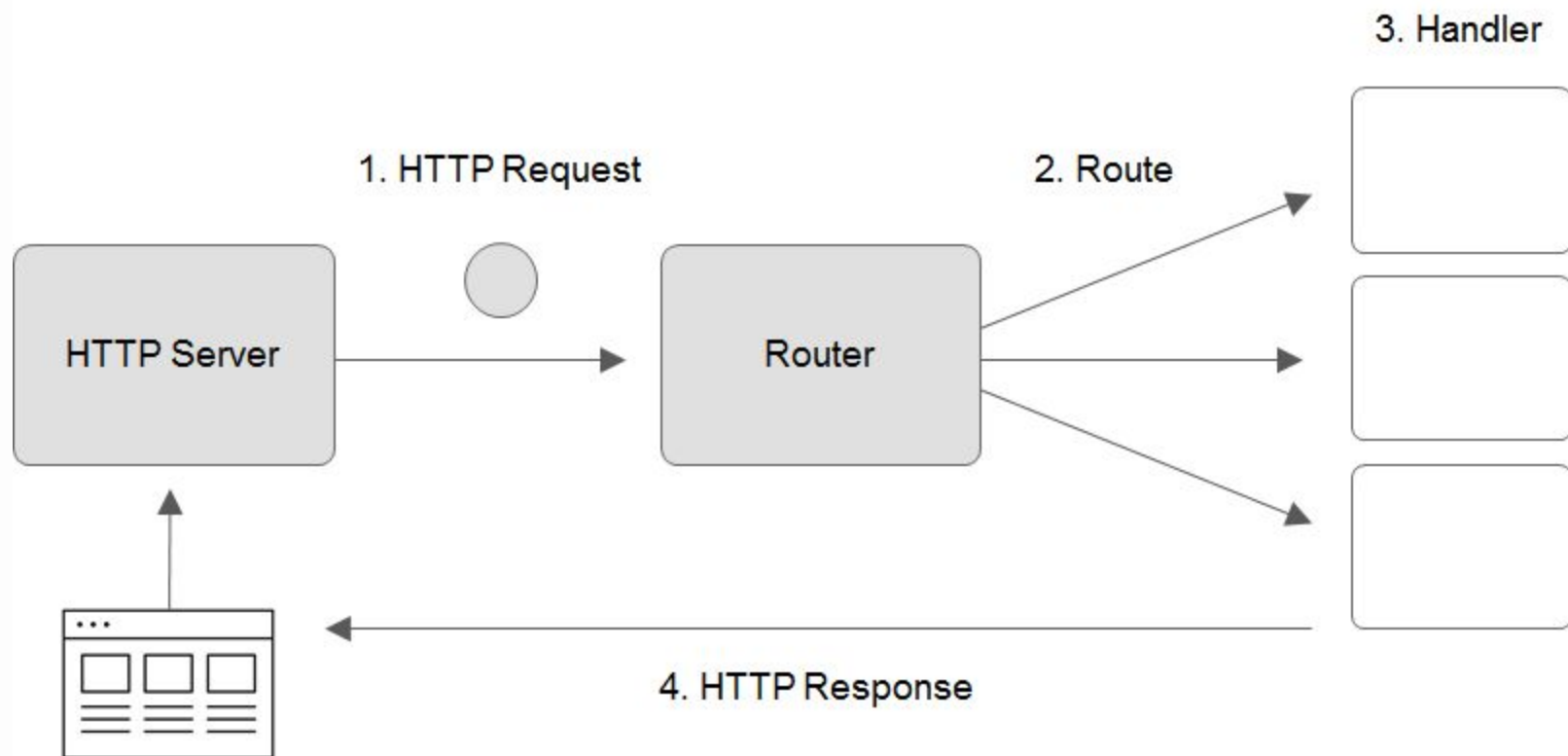






Jfokus

Web Apps & REST

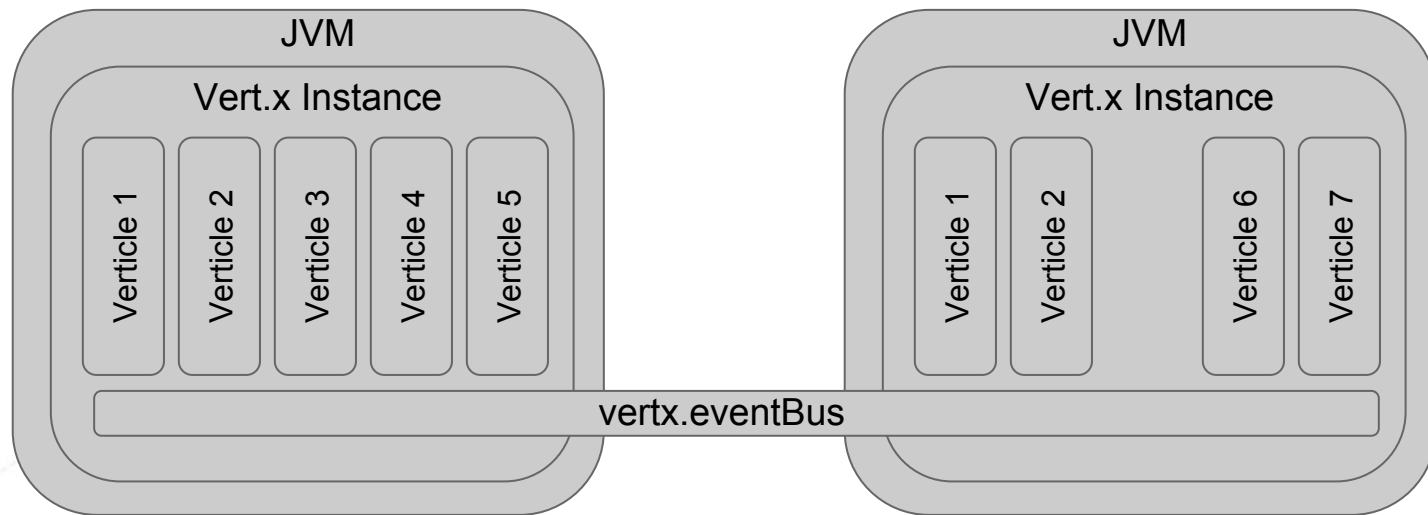


Vert.x HTTP Router

```
router.get("/api/whiskies").handler(this::getAll);
router.get("/api/whiskies/:id").handler(this::getOne);
router.post("/api/whiskies").handler(this::addOne);
router.delete("/api/whiskies/:id").handler(this::deleteOne);
router.put("/api/whiskies/:id").handler(this::updateOne);
// Serve static resources from the /assets directory
router.route("/assets/*").handler(StaticHandler.create("assets"));
```

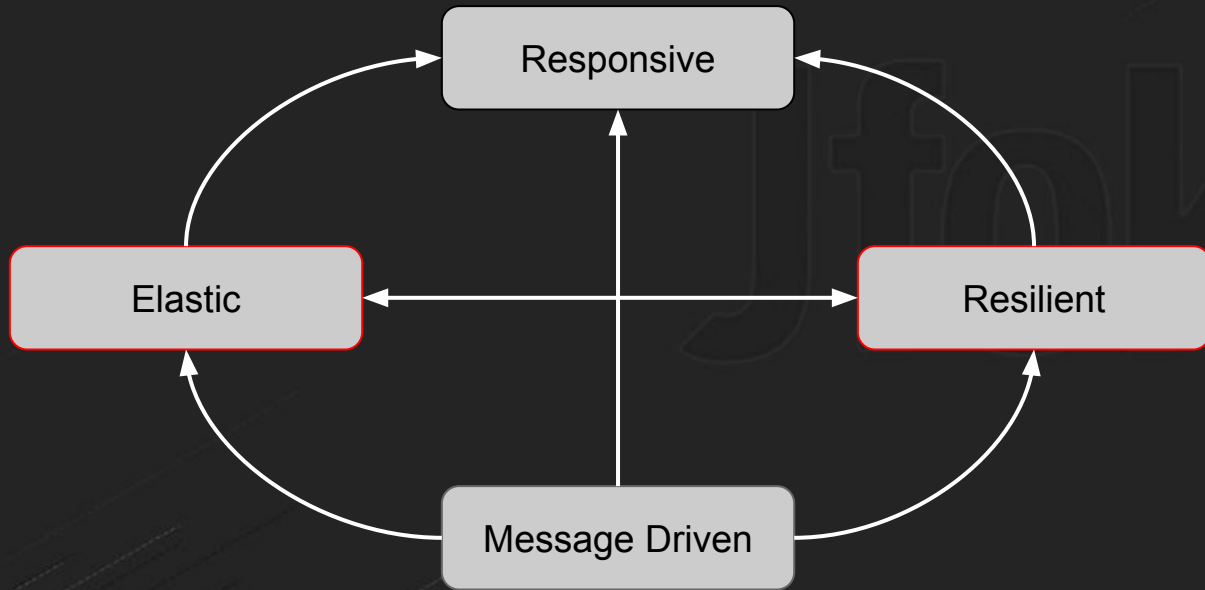
```
vertx
  .createHttpServer()
  .requestHandler(router::accept)
  .listen(8080, result -> {
    if (result.succeeded()) {
      future.complete();
    } else {
      // could be something else is running on our port
      future.fail(result.cause());
    }
  });
```

Vert.x EventBus



Reactive Manifesto

Reactive Systems





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